

From: "Clark, Dave" <Dave.Clark@hdrinc.com>
To: "Suplee, Mike" <msuplee@mt.gov>, "Jeff Blend (jblend@mt.gov)" <jblend@mt.gov>
Cc: Tina Laidlaw/MO/R8/USEPA/US@EPA, "McInnis, Amanda" <Amanda.McInnis@hdrinc.com>, "Falk, Michael" <Michael.Falk@hdrinc.com>, "Reardon, Dave" <Dave.Reardon@hdrinc.com>
Date: 07/19/2011 12:29 PM
Subject: FW: Follow-up - WERF Sustainability Study

Mike and Jeff; Tina Laidlaw asked that we pass along a draft of the WERF Nutrient Sustainability Study for your reference. We presented this study in a peer review workshop on August 10, 2010 in Denver that included Phil Zahreddine of the EPA Office of Wastewater who served as one of the peer reviewers on the study. The report has been updated to incorporate the peer reviewer's comments and WERF has allowed us to share this final draft with some, but please note that this report is not yet ready for distribution since WERF is still in the process of final review.

We've also sent a copy to

Please let me know if you have questions about the study.
Thanks

Dave

David L. Clark
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From: Clark, Dave
Sent: Wednesday, June 22, 2011 11:48 AM
To: 'Laidlaw.Tina@epamail.epa.gov'
Cc: Falk, Michael; McInnis, Amanda; Reardon, Dave
Subject: RE: Follow-up - WERF Sustainability Study

Tina – Attached is an updated draft of the WERF Nutrient Sustainability Study for your reference. Please note that this report is not yet ready for distribution since WERF still needs to get a chance to look at the final revisions.

We've also sent a copy to Phil Zahreddine at EPA Office of Wastewater and that Phil served as one of the peer reviewers on the study.

Please let me know if you have questions about the study. If appropriate, we could get the study team together for a conference call or LiveMeeting to give a briefing on the findings and respond to questions.

Thanks

Dave

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From: Falk, Michael
Sent: Tuesday, June 21, 2011 11:25 PM
To: Zahreddine.Phil@epamail.epa.gov
Cc: Clark, Dave
Subject: RE: Follow-up - WERF Sustainability Study

Phil,

Attached is the updated WERF Report. Note, it is still not finalized by WERF so please don't disseminate yet.

As for your question on Deep Well Injection (DWI):

In looking at the capital and operations cost in Table 17 of Chapter 5 of the 2010 draft report and the process descriptions for each treatment level, it is mentioned that deep well injection (DWI) of brine is assumed for treatment level 4. So, I wanted to confirm that the associated DWI capital and O&M costs are included in the values shown in Table 17 and if possible, know what these figures are. Your response would be highly appreciated.

Yes, the DWI capital and O&M costs are included in the values. I used the Mickley et al. (2001; attached) to

determine the DWI capital in 2010 dollars (just under 7 million dollars).

As for O&M, I assumed 1,000 psi (2,310' head) pumping for the brine reject flow (i.e., 20% of 5.4 mgd = 1.1 mgd) at a 70% pump efficiency (630 hp). This equates to \$410k per year (\$0.10/kWh). Any sort of monitoring requirements were not included as this is state specific.

Feel free to call if you want to discuss any of the details, 916.517.9012.

Mike

Michael Falk, PhD, PE
Water and Wastewater Engineer
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Michael.Falk@hdrinc.com
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From: "Falk, Michael" <Michael.Falk@hdrinc.com>
To: Phil Zahreddine/DC/USEPA/US@EPA
Date: 05/25/2011 08:21 PM
Subject: RE: Follow-up - WERF Sustainability Study

Phil,

Nice to hear from you. Unfortunately, we are about a week or so out from sending the final version to Amit. As soon as we finalize, I will send the final version to you. Regarding costs, they have been tweaked a bit so I would hold off on using the numbers from Denver.

Mike

-----Original Message-----

From: Zahreddine.Phil@epamail.epa.gov [mailto:Zahreddine.Phil@epamail.epa.gov]
Sent: Wednesday, May 25, 2011 2:14 PM
To: Falk, Michael
Subject: Follow-up - WERF Sustainability Study

Michael:

I have not seen you since WEFTEC last year. Hope all is well.

In terms of the study HDR was conducting for WERF on sustainability in nutrient removal, I was wondering if the study and draft report you provided last August was completed and if so, whether you can provide an

electronic copy of the final report. One particular issue of interest is whether the unit capital and O&M costs for the various levels of treatment and the associated process trains changed significantly. I hope to hear from you soon.

Best Regards,
Phil,

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From: "Falk, Michael" <Michael.Falk@hdrinc.com>
To: "Spencer, Ginger" <Ginger.Spencer@hdrinc.com>
Date: 08/10/2010 12:41 AM
Subject: WERF Denver Workshop Updated Agenda

WERF Workshop Attendees,

The workshop is this Wednesday at Denver Metro. I have attached an updated Agenda.

Registration begins at 730 am, with the workshop beginning at 830 am.

Remember that a government issued ID (e.g., Driver's License) is required to enter Denver Metro so have that ready at the gate.

For those taking the workshop shuttle to/from the Timbers, we plan to depart the Timbers at 745 am.

Denver Weather for Tuesday (High 89/Low 63; 0% Precipitation)
Wednesday (High 93/Low 66; 10%
precipitation)

I attached the draft report for those that have not yet received an electronic copy

Please call myself, 530-219-2078, or Dave Reardon, 916-996-2750, for any questions.

See you Wednesday,
Mike

Michael Falk, PhD
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[attachment "WERF SustainabilityWP 20100706.pdf" deleted by Phil Zahreddine/DC/USEPA/US] [attachment "WERF Denver Agenda.doc" deleted by Phil Zahreddine/DC/USEPA/US] << File: WERF SustainabilityWP 20110619.docx >> << File: Membrane_Concentrate_Disposal_Mickley report.pdf >> [attachment "WERF SustainabilityWP 20110619.docx" deleted by Tonya Fish/R8/USEPA/US]